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EXAMINER	
ZARA, JANE J	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/701,007	ALLERSON ET AL.	
	Examiner	Art Unit	
	Jane Zara	1635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *34,37,38,49,53-62,72,74-78,94-96 and 104* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34, 37, 38, 49, 53-62, 72, 74-78, 94-96, and 104* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to the communications filed 6-4-09.

Claims 34, 37, 38, 49, 53-62, 72, 74-78, 94-96, and 104 are pending in the instant application.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6-4-09 has been entered.

Response to Arguments and Amendments

Applicant's arguments with respect to claims 34, 37, 38, 49, 53-62, 72, 74-78, 94-96, and 104 under 35 U.S.C. 103(a) have been considered but are moot in view of the new ground(s) of rejection set forth below. Applicant's arguments are addressed below as they pertain to the new rejection of record.

Withdrawn Rejections

Any rejections not repeated in this Office action are hereby withdrawn.

Maintained Rejections

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 34, 37, 38, 49, 53-62, 72, 74-78, 94-96, and 104 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 36, 44, 46-49, 52-64, 74-80, 93, 98-100 and 106 of copending Application No. 10/860,265 for the reasons of record set forth in the Office action mailed 12-8-08.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

No arguments have been made addressing this rejection.

Claims 34, 37, 38, 49, 53-62, 72, 74-78, 94-96, and 104 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 35-63 of copending Application No. 11/054,848 for the reasons of record set forth in the Office action mailed 12-8-08.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

No arguments have been made addressing this rejection.

New Rejections

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 34, 37, 38, 49, 53-62, 72, 74-78, 94-96, and 104 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elbashir et al (EMBO J., Vol. 20, No. 23, pages 6877-6888, 2001), Giese et al (US 2004/0180351), Fosnaugh et al (US

2003/0143732) and Morrissey et al (US 2003/0206887), the combination in view of the combined teachings of Arnold et al (USPN 6,262,036), Damha et al (US 2005/0142535) and McKay et al (USPN 6,133,246).

The claims are drawn to compositions comprising chemically synthesized siRNA oligonucleotides comprising an alternating motif having a 2'-F and a β-D-deoxyribonucleoside as alternating nucleosides, wherein one or both of the self complementary strands of the siRNA molecule comprise this alternating motif, and which siRNA optionally further comprise, in addition to the above alternating motif, internucleotide linkage modifications comprising phosphorothioate internucleotide linkages, and which oligonucleotides optionally further comprise 3'-and/or 5'-terminal caps, optionally including inverted deoxy abasic moieties, or optionally comprises one or more terminal overhanging nucleobases.

Elbashir et al (EMBO J., vol. 20, No. 23, pages 6877-6888, 2001) teach methods of target gene inhibition in embryo lysates comprising siRNA molecules comprising 2'-deoxy and 2'- substitutions. Elbashir et al teach the means and routine methods to obtain a correlation between the placement of 2'-substitutions on the siRNA oligonucleotides and the retention of siRNA activity (see esp. the abstract on p. 6877, fig. 8 and text on p. 6885).

Giese et al (US 2004/0180351) teach siRNA molecules comprising alternating 2' substituted nucleobases with enhanced stability and prolonged inhibitory capacity compared to unmodified siRNA molecules, and optionally additionally comprising

terminal overhanging nucleobases (see esp. Fig. 12, 14; paragraphs 0124, 0182, example 11, e.g., paragraphs 0189-0193, claim 18).

Fosnaugh et al (US 2003/0143732) teach various configurations of 2'-modifications, including 2'-fluoro or 2'-methoxyalkyl groups of various alkyl chain lengths, and which oligonucleotides optionally further comprise, in addition to different motifs of differing 2'-substituent containing motifs, internucleotide linkage modifications comprising phosphorothioate internucleotide linkages, and which oligonucleotides optionally further comprise 3'-and/or 5'-terminal caps and optionally including inverted deoxy abasic moieties on the termini, and the routine experimentation involved in testing the effect of arrangements of these different modifications on siRNA ability to bind to and inhibit target gene expression in the presence of RISC. Fosnaugh et al also teach compositions comprising modified and unmodified siRNAs in the presence of RISC for target gene inhibition see p. 1, 3-4, 6-9, p. 16 and figures 4 and 5, claim 30).

Morrissey et al (US 2003/0206887) teach various ways of designing and optimizing 2'- modifications on siRNA, including 2'-fluoro or methoxyalkyl groups of various alkyl chain lengths, and abasic, inverted abasic termini and 5' and 3' capped termini, and the effect of various motifs or arrangements of these 2'substitutuents and modified phosphorothioate internucleotide linkages on target gene inhibition by siRNA in compositions further comprising RISC (see fig. 4 and 5, page 1, right col., p. 6, right col., p. 9, p. 20-21, claims 20-25).

The primary references do not teach an alternating motif having a 2'-F and a β-D-deoxyribonucleoside as alternating nucleosides, wherein one or both of the self complementary strands of the siRNA molecule comprise this alternating motif.

Arnold et al (USPN 6,262,036) teach the modification and testing of inhibitory oligonucleotides comprising alternating 2'-β-D-deoxynucleosides with 2'-modified nucleosides, and the introduction of these modifications for enhancing target binding stability (see esp. example 34, col. 48-50).

Damha et al (US 2005/0142535) teach the modification and testing of inhibitory activity of antisense oligonucleotides comprising alternating 2'-β-D-deoxynucleosides with 2'-modified nucleosides in antisense oligonucleotides for enhancing target binding by antisense molecules for the binding and inhibition of target gene expression.

McKay et al (USPN 6,133,246) teach numerous motifs and combinations of modified residues within antisense oligonucleotides, including the incorporation of 2'-modified sugars which include 2'-fluoro, 2'-bromo, 2'-O-alkyl groups, modified nucleobases, modified internucleotide linkages, 2'-β-D-deoxynucleosides and combinations thereof, as well as the optimization of modifications for maximizing target binding, cellular uptake and oligonucleotide stability (see esp. col. 7-12; Tables 4-26, esp. Tables 11 and 12, and Table 26).

It would have been obvious to incorporate various motifs and configurations of 2'-modifications, including fluoro or methoxyalkyl groups of various alkyl chain lengths, and which oligonucleotides optionally further comprise, in addition to different motifs of differing 2'-substituent containing motifs, internucleotide linkage modifications

comprising phosphorothioate internucleotide linkages, and which oligonucleotides optionally further comprise 3'-and/or 5'-terminal caps and optionally including inverted deoxy abasic moieties on the termini into siRNA molecules for enhancing their target binding and stability, yet minimizing inactivation of the siRNA ability to inhibit target gene expression because Elbashir et al, Fosnaugh et al and Morrissey et al all teach the designing and testing of various arrangements of modified siRNA for their ability to inhibit target gene expression. It would have been obvious to design and test the instantly claimed alternating motif having a 2'-F and a β-D-deoxyribonucleoside as alternating nucleosides, wherein one or both of the self complementary strands of the siRNA molecule comprise this alternating motif because Giese teaches increased siRNA stability from nucleases and increased and sustained target gene inhibition using siRNA with alternating 2' modified residues. The features of enhanced stability, enhanced target binding, enhanced cellular uptake had been taught previously for oligonucleotides comprising 2' modified residues, the assays for siRNA activity were well known in the art, and the techniques for incorporating the claimed modifications were also well known in the art at the time of the instant invention and would have involved routine experimentation. Alternating modified residues have been assayed in all types of inhibitory oligonucleotides, including in antisense and siRNA molecules and have been taught as feasible design choices for enhancing inhibitory oligonucleotide stability, cellular uptake, target binding and inhibitory capabilities.

One of ordinary skill in the art would have incorporated alternating 2'-β-D-deoxynucleosides with 2'-modified nucleosides into RNAi molecules because it was well

known at the time of the invention that such alternating modifications enhanced target binding stability of the antisense oligonucleotides for their target regions, as taught previously by Arnold et al and Damha et al. One of ordinary skill would have expected that the incorporation of these modifications are optimized using routine experimentation because Damha, McKay and Arnold all teach optimization experiments where antisense oligonucleotides comprising an array of different combinations of these well known modifications are tested for their ability to target and bind target genes and inhibit their expression, the ability to incorporate the modifications claimed were well known in the art, and testing different motifs was very routine at the time the instant invention was made. One of ordinary skill in the art would have been motivated to combine the teachings of Elbashir et al, Fosnaugh et al and Morrissey et al, as applied to modifying and testing the activity of siRNA, with the teachings by McKay, Damha and Arnold regarding the incorporation of modifications into inhibitory oligonucleotides, for enhancing their ability to bind a target gene and for their ability to enhance oligonucleotide stability, and design the motifs instantly claimed, including alternating 2'-β-D-deoxynucleosides with 2'-modified nucleosides.

One of ordinary skill in the art would have expected that the siRNA molecules, modified with the various and appropriate configurations would provide target gene cleavage in the presence of an appropriate target gene sequence and in the presence of appropriately modified siRNA. One of ordinary skill in the art would have produced various motifs as a matter of design choice and optimizing 2'- modified motifs within the siRNA while maintaining its siRNA activity would have been a matter of design choice

after testing various modifications and their combinations in a manner previously done by many in the art for antisense, such as McKay and Arnold. One of ordinary skill in the art would have designed and tested such modification motifs because it was well known in the art at the time of the instant invention that incorporation of 2'-O-methoxy alky or 2'-deoxy, or 2'-fluoro modifications at appropriate positions within the siRNA allows for enhanced oligonucleotide stability, target binding and the trigger of target gene degradation by RISC. One of ordinary skill in the art would also have been motivated to incorporate 5', and/or 3' caps, including abasic and inverted abasic nucleotide or other terminal well known caps because these modifications were well known in the art to protect oligonucleotides from degradation, as taught previously by Morrissey.

Applicant's arguments filed 6-4-09 have been fully considered but they are not persuasive. Applicant argues that the prior art of Elbashir, Fosnaugh, Morrissey, Arnold, Damha and McKay fail to teach or suggest the particular pattern of chemical modifications presently claimed, and instead merely provide generalized teachings regarding chemical modification of nucleic acids. Applicant also argues that Elbashir provides no guidance as to which modifications at what positions may be tolerated and teaches away from the present invention because Elbashir found that siRNA containing fully modified nucleotides abolishes inhibitory activity. Applicant additionally argues that the prior art does not teach ways of designing and optimizing such configurations as instantly claimed, but instead describes vast genii of siRNA molecules and broadly discusses possible chemical modifications for the molecules. Applicant argues, for instance, the Fosnaugh and Morrissey provide not guidance as to which positions might

be critical for siRNA mediated inhibition, and that the pattern of modifications taught by them depends entirely upon the base sequence of the particular oligonucleotide, and they fail to teach alternating motifs. Applicant also argues that the secondary references describe oligonucleotides utilizing RNase H-dependent mechanisms and such different mechanisms would not provide reasons to believe that the modifications or motifs useful for one would have been useful in the other.

Contrary to Applicant's assertions, the reliance upon the teachings of Elbashir, Giese, Fosnaugh, Morrissey, Arnold, Damha and McKay do indeed render the instantly claimed invention obvious. Giese teaches the routine optimization of incorporating alternating motifs on the different strands of siRNA, the retention of sustaining gene silencing activity, and enhanced resistance to nuclease degradation. Morrissey is very clear about the motivation to correlate siRNA activity (as a result of stability, target binding and inducing target gene cleavage) with the incorporation of various well known oligonucleotide modifications, which are tested as incorporated on either of the two strands of an siRNA molecule (see paragraph 0050):

> Non-limiting examples of such chemical modifications include without limitation phosphorothioate internucleotide linkages, 2'-deoxyribonucleotides, 2'-O-methyl ribonucleotides, 2'-deoxy-2'-fluoro ribonucleotides... and/or inverted deoxy abasic residues incorporation. These chemical modifications, when used in various siNA constructs, are shown to preserve RNAi activity in cells while at the same time, dramatically increasing the serum stability of these compounds...

And in paragraph 0052:

> In a non-limiting example, the introduction of chemically-modified nucleotides into nuclei acid molecules will provide a powerful tool in

overcoming potential limitations of in vivo stability and bioavailability inherent to native RNA molecules that are delivered exogenously.

Elbashir teaches the means and motivation to test the effect of various modifications on siRNA activity. In the bridging paragraph between pages 6881-6882, Elbashir teaches that substitution of 8 out of 42 nucleotides of the siRNA duplex did not lead to loss of activity, and that SiRNA with 2'-deoxynucleotides produced "significantly active siRNAs". This is in contrast to complete substitution of one or both siRNA strands with either 2'-O-methyl or 2'-deoxy residues, which led to abolition of RNAi activity. And on page 6884, second full paragraph, some of the "most efficient siRNA duplexes" included 2'-deoxy modifications. So, contrary to Applicant's assertions, the teachings of Elbashir, Fosnaugh, and Morrissey emphasize the importance of routinely testing the placements and types of modifications on siRNA, and the effects of these modifications and their locations on the siRNA molecule on oligonucleotide stability, target binding and the inhibitory capabilities of siRNA.

What's more, Giese, Arnold and Damha taught the well known motif of alternating modified residues, and how to balance the advantages provided by incorporating these modifications with the particular requirements of the inhibitory mechanism utilized by the inhibitory oligonucleotides. This prior art taught the incorporation of 2'-β-D-deoxynucleosides with 2'-modified nucleosides in oligonucleotides for enhancing target binding and stability. Arnold and Damha both stressed the importance of having some deoxyribonucleosides on an antisense strand, which deoxyribonucleosides are in a 2'-endo conformation, as opposed to the 3'-endo conformation of ribonucleosides, for successful oligonucleotide binding to the target

nucleic acid molecules. On the other hand, Arnold also taught lower binding affinity toward complementary target strands of 2-deoxyribonucleosides compared to 2'-substituted nucleosides. These features are important to balance for effective target gene inhibition using both antisense mediated and siRNA mediated gene inhibition. Both mechanisms require efficient target binding by the inhibitory oligonucleotides. Therefore one of ordinary skill in the art would have been motivated to test obvious combinations of modified residues, such as alternating residues of 2'-Fluoro and 2-deoxy nucleosides on siRNA oligonucleotides to see if these motifs would provide for enhanced target gene cleavage. Such an example of routine experimentation is taught by Giese with respect to alternating motifs on sense and antisense strands of active siRNA molecules. The means for incorporating such motifs required routine experimentation at the time of the instant invention, and assaying for target inhibition in the presence of siRNA bearing different motifs required routine assays well known in the art.

In addition, the effect of various arrangements of different modifications on SiRNA ability to bind to and inhibit target gene expression in the presence of RISC was taught by many in the art, including Giese and Fosnaugh, whose modified siRNAs included various motifs and configurations of 2'-modifications, including alternating motifs, and including the incorporation of fluoro or methoxyalkyl groups of various alkyl chain lengths, and which oligonucleotides optionally further comprised, in addition to different motifs of differing 2'-substituent containing motifs, internucleotide linkage modifications comprising phosphorothioate internucleotide linkages, and which

oligonucleotides optionally further comprised 3'-and/or 5'-terminal caps and optionally included inverted deoxy abasic moieties on the termini. The effect of different arrangements of these various modifications on SiRNA ability to bind to and inhibit target gene expression in the presence of RISC was therefore taught previously by Fosnaugh.

Morrissey also taught various ways of designing and optimizing 2'- modifications on siRNA, including fluoro or methoxyalkyl groups of various alkyl chain lengths, and abasic, inverted abasic termini and 5' and 3' capped termini. And Morrissey taught the effect of various motifs or arrangements of 2'-substitutuents and modified phosphorothioate internucleotide linkages on target gene inhibition by siRNA in compositions further comprising RISC.

Elbashir, Giese, Fosnaugh and Morrissey taught the routine experimentation involved in designing and testing arrangements of modified residues on siRNA for their ability to inhibit target gene expression, and the importance of balancing the introduction of stabilizing and other modifications into the antisense strand with the minimal requirements of RISC recognition and target cleavage. The testing of modified siRNA molecules for inhibitory activity required routine experimentation of various design choices, nothing more. All of the instantly claimed modifications were well known in the art, and researchers in the art routinely assayed different configurations of modifications for antisense, ribozyme and siRNA mediated inhibition. McKay taught numerous motifs and combinations of modified residues within antisense oligonucleotides, including the incorporation of 2'-modified sugars which include 2'-fluoro, 2'-bromo, 2'-O-alkyl groups,

modified nucleobases, modified internucleotide linkages, 2'-β-D-deoxynucleosides and combinations thereof, as well as the optimization of modifications for maximizing target binding, cellular uptake and oligonucleotide stability (see esp. col. 7-12; Tables 4-26, esp. Tables 11 and 12, and Table 26).

McKay is relied upon in the instant 103 rejection for teaching various combinations of modified residues incorporated into antisense oligonucleotides, including 2'-modified nucleosides which include the incorporation of 2'-fluoro, 2'-bromo, 2'-O-alkyl groups, as well as the incorporation of modified nucleobases, internucleotide linkages, 2'-β-D-deoxynucleosides, and combinations thereof. McKay is therefore properly relied upon for the routine experimentation of incorporating these well known modifications into various motifs, and is relied upon for teaching the well known effects of these modifications, including enhancing target binding, cellular uptake and oligonucleotide stability.

Giese, Fosnaugh and Morrissey both taught effects on gene silencing activity after incorporating various motifs and configurations of 2'-modifications into siRNA molecules, including the incorporation of fluoro or methoxyalkyl groups of various alkyl chain lengths, and which oligonucleotides optionally further comprised phosphorothioate internucleotide linkage modifications, 3'-and/or 5'-terminal caps, and inverted deoxyabasic terminal moieties. Giese, Fosnaugh and Morrissey taught the routine experimentation involved in testing the effects of different arrangements of these various, well known modifications on siRNA's ability to bind to and inhibit target gene expression in the presence of RISC. Giese, Fosnaugh and Morrissey also are relied

upon for teaching compositions comprising modified and unmodified siRNAs (and RISC) for target gene inhibition.

Damha taught alternating 2'-β-D-deoxynucleosides with 2'-modified nucleosides in inhibitory oligonucleotides, and the effects of this configuration on various properties of inhibitory oligonucleotides, including effects on target binding by antisense molecules and their inhibition of target gene expression. Damha taught the effects of various motifs or configurations of modified residues on the antisense oligonucleotides' abilities to inhibit target expression, particularly on their ability to elicit RNAse H cleavage of a target strand.

Giese, Arnold, Damha all taught the well known motif of alternating modified residues on inhibitory oligonucleotides, including the incorporation of 2'-β-D-deoxynucleosides with 2'-modified nucleosides in oligonucleotides for enhancing target binding and stability. Arnold compared the inhibitory capabilities of inhibitory oligonucleotides in the presence of modified and unmodified internucleotide linkages. Arnold taught inhibitory oligonucleotides comprising alternating 2'-β-D-deoxynucleosides with 2'-modified nucleosides, and the introduction of these modifications for enhancing target binding stability (see esp. example 34, col. 48-50).

So, contrary to Applicant's assertions, the motif comprising alternating 2'-β-D-deoxynucleosides with 2'-modified nucleosides was well known in the art, the testing of various configurations of the modifications claimed on siRNA activity required routine experimentation well known in the art. And the teachings of Giese, Elbashir, Fosnaugh, Morrissey, Arnold, Damha and McKay, regarding the advantages of modifying

oligonucleotides to enhance stability and target binding, while retaining siRNA or antisense activity, actually provide a reasonable expectation of success of finding the instantly claimed design choice of modified oligonucleotides which retain siRNA activity, and therefore render the instant invention obvious. Since alternating motifs were well known design choices, the instant motif would have been a logical design choice to test for enhanced siRNA activity, and not the result of an infinite possibility of choices, as suggested by Applicant.

Giese, Elbashir, Fosnaugh and Morrissey all taught the designing and testing of various arrangements of modified residues on siRNA for their ability to inhibit target gene expression - using routine experimentation for both the incorporation of these well known modifications, and assaying different configurations for siRNA mediated inhibition. One of ordinary skill in the art would have incorporated 2'-β-D-deoxynucleosides and 2'-modified nucleosides, including the well known 2'-fluoro modification, into siRNA molecules because these modifications were well known in the art to offer potential stabilizing, target binding and cellular uptake advantages over unmodified residues at the time of the instant invention. An alternating motif would have been a logical configuration or design choice to incorporate into and siRNA molecule, and testing the effect of such a well known configuration would have involved routine experimentation at the time of the instant invention.

For these reasons, the instant invention as a whole would have been *prima facie* obvious to one of ordinary skill at the time it was made.

Conclusion

Certain papers related to this application may be submitted to Art Unit 1635 by facsimile transmission. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 C.F.R. ' 1.6(d)). The official fax telephone number for the Group is 571-273-8300. NOTE: If Applicant does submit a paper by fax, the original signed copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED so as to avoid the processing of duplicate papers in the Office.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jane Zara whose telephone number is (571) 272-0765. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Douglas Schultz, can be reached on (571) 272-0763. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jane Zara
7-28-09

/Jane Zara/

Primary Examiner, Art Unit 1635